Accessing the Web Page
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aquaculture operators is found on the web page. The list includes all aquaculture and fee fishing facilities. Included are the names of the facilities, operators, addresses, COR numbers and phone numbers. The facilities are segregated into counties.

Aquaculture forms can be obtained from the site. Included is the Certificate of Registration (COR) Application Form, the Certificate of Registration (COR) Application Form for Fish Processing Plants, Fish Health Approval Form for Warm Water Species, Fish Health Statement, Fish Movement Report Form and Notice of Treatment and Notice of Testing Forms for Asian Tapeworm. The forms necessary to obtain an import permit and species and site approvals are contained herein.

The Fish Health Policy Board section contains Classifications of Pathogens, Emergency Response Procedures, Fish Health Policy Board Members and Related Government Officials and Procedures for the Timely Reporting of Pathogens.

UDAF Policies and Procedures are incorporated in the web page. They include Fish Health Approval and Inspection, How to Obtain an Import Permit, How to Obtain a Certificate of Registration (COR), UDAF Policy on Asian Tapeworm and UDAF Policy on Importation of Non-GSL Brine Shrimp Cysts.

The page contains a section on Aquaculture Reports and Documents. This includes A Basic Biosecurity Model for Aquaculture Sites, Asian Tapeworm Hosts, and a color brochure on "Whirling Disease and Aquaculture". The Fish Health Program produced the brochure.

The Frequently Asked Questions section contains information of How to Get Rid of Water Weeds and Algae and Whirling Disease. The 1997, 1998, 1999 and 2000 issues of *Aquaculture News* are also included.

FEE FISHING FACILITIES CONTRIBUTE TO CHRISTMAS AUCTION

On December 5, 2001 the Utah Department of Agriculture and Food held an auction to benefit those in need. The day before the auction, Fish Health got the idea to see if fee fishing owners would be interested in contributing fishing opportunities. We were able to contact a few owners, and the response was great. The "Christmas Box House" received the benefits of those who generously contributed. Neal Barker (Cold Springs Trout Farm), Steve Judd (Spring Lake Trout Farm), Randy Snell (Fish-n-Fun), Grant White (Trout of Paradise), Karl Dean and Steven Rosenzweig all donated fee fishing at their facilities for an auctioned price. Both Mark Wilson (Red Canyon Lodge) and Nick Stevenson (LC Ranch) offered a one night's stay to a couple with the highest bid. The auction was a great success, and roughly $200 was raised for fee fishing activity. A special thanks to those contacted who contributed. It is our intent to expand this opportunity to all fee fishing facilities for 2002. If you wish to participate in the December 2002 auction, please let us know.

FISH SHOULD NOT BE FED PRIOR TO INSPECTIONS

When UDAF inspectors cut open trout to obtain samples at your hatchery, it is important that food is not in their gastrointestinal tracts. Otherwise, there is a greater chance

Continued .

FISH HEALTH INSPECTS BRINE SHRIMP PLANTS

In August of 2001 Dr. Marshall assigned the inspection of brine shrimp plants in Utah to the Fish Health Program. Veterinarians in the Division of Animal Industry had been inspecting them previously. Currently, there are 26 brine shrimp companies licensed by UDAF. Most of the companies are situated in the vicinity of the Great Salt Lake, and inspections are done quarterly. Sanitation, facility cleanliness, cyst disinfection and product testing and verification are included in the inspection. A major part of the inspection is to determine if companies are importing foreign cysts and to ensure that brine shrimp waste products are disposed of properly. Permits issued by the Department are good for 120 days and must be renewed thereafter if the company wishes to sell product.

Processing Plant
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outside Utah, which often have inferior genetic qualities. This action fulfills the COR rule R58-17-17(A).

that exposing the ingesta or excreta after cutting the gut or stomach can contaminate the sample and cause false positive test results. A false positive would falsely indicate the presence of a pathogen. Therefore, we request that you do not feed your fish for 24-48 hours before the fish are sacrificed. Although every precaution is undertaken to prevent cross-contamination this will help ensure that it does not occur.

Newsletter on Current Trends in Aquaculture

Utah Department of Agriculture and Food . Division of Animal Industry
350 N. Redwood Rd., Box 146500, SLC, UT 84114 (801)538-7029
www.ag.utah.gov

January 2002

DR. THOMAS J. BALDWIN ACCEPTS LAB POSITION IN LOGAN

In the summer of 2001, Dr. Thomas J. Baldwin (Tom) was selected to be the director of the Utah Veterinary Diagnostic Laboratory in Logan, Utah. He started his directorial duties there in September of 2001.

Dr. Baldwin and his wife, Sandra, have four children: Jessica, Matthew, Sarah and Jason. Dr. Baldwin graduated Cum Laude with his Bachelors of Science from Washington State University (WSU) and completed his veterinary degree at WSA, College of Veterinary Medicine in 1988. He completed his Ph.D. and veterinary pathology training at Louisiana State University under Dr. Joseph Newton in 1992. His research focused on the pathogenesis of *Edwardsiella ictaluri* in catfish, focusing on the early events of the infection.

After completing his Ph.D., Dr Baldwin was recruited back to WSU to start an Aquatic Health Program as well as to perform diagnostic duties as a veterinary pathologist for all species of animals in the Washington Animal Disease Diagnostic Laboratory (WADDL).

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BASS, TROUT, TILAPIA AND SHRIMP ARE INCLUDED IN ARIZONA'S FISH FARMING INDUSTRY

Gary Wood, his father, and uncle have been rearing shrimp on their Wood Brother's Farm near Gila Bend in southern Arizona since the mid-1990s. In the past the farm usually produced less than 100,000 pounds of shrimp annually. However, Wood recently expanded his shrimp ponds to more than 50 acres, and he expects to harvest more than 500,000 pounds of shrimp in 2001.

Overall, aquaculture in Arizona yielded nearly $3.3 million last year as farmers raised a combined 1.3 million pounds of striped and largemouth bass, catfish, tilapia and trout and 168,000 pounds of shrimp. The industry in Arizona is worth $1 billion nationally. There are 30 licensed fish farms in Arizona.

A total of 51 million pounds of fish are consumed annually by Arizona residents, making an average of 10 pounds of fish eaten by each resident per year. Arizona farmers predict the demand for fish consumption in the state will steadily increase. It is estimated that the industry could easily grow to $50

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HOW TO ACCESS THE FISH HEALTH WEB PAGE

Aquaculture program reports, rules, operator lists, forms, regulations, newsletters, applications, policies and procedures, reports, documents and frequently asked questions are all located on the Fish Health web page. The web page may be located by accessing the UDAF home page at www.ag.utah.gov. The next step is to click on "divisions" and the Animal Industry main page. The Fish Health page can be accessed on the Animal Industry site.

The Fish Health web page contains all of the information you need for obtaining approvals and licenses from the UDAF. The web page provides the names and phone numbers of the Fish Health staff. It contains Fish Health Program reports that outline annual program activities. It contains the Utah Aquaculture Act and Administrative Rules. Included are the Utah Aquaculture and Aquatic Animal Rule, the Utah Aquaculture Act, the Utah Administrative Rule on Collection, Importation, Transportation, and Possession of Zoological Animals and the Utah Aquaculture and Fish Stocking Rule.

A list of the currently registered

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Dr. Baldwin
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He was given a dual appointment in the Department of Veterinary Microbiology and Pathology, where he continued his research of *E. ictaluri* with his graduate student Ramona Skirpstunas. Dr. Skirpstunas is a veterinarian who recently completed the pathology residency/PhD program offered at WSU College of Veterinary Medicine and is joining Dr. Baldwin as a pathologist at the Utah Diagnostic Laboratory.

While he was at WADDL, Dr. Baldwin attained his board certification in veterinary pathology and became an American Fisheries Society Health Inspector and a Canadian Fish Health Official. During his tenure at WADDL, the lab became the first USDA approved aquatic health laboratory in the United States and was used as a prototype for other laboratories wishing to become USDA approved. The WADDL program went from seven aquatic health certification submissions in 1994 to 177 in 2000, with over 26,500 individual assays performed in 2000.

During the same time Dr. Baldwin also participated in the training of pathology residents (anywhere from 10 to 20 residents participating in the program at one time). He also performed necropsies and read out biopsies on all species of animals, consulted on clinical fish cases coming through the veterinary clinic, gave lectures on fish health and anatomy to veterinary and undergraduate students and advised veterinary students interested in fish medicine.

While Dr. Baldwin was at WADDL he worked closely with Jim Peterson and Dick Vincent of Montana Fish, Wildlife and Parks doing survey work and histologic analysis of salmonids infected with whirling disease (*Myxobolus cerebralis).* During the course of their work, Dr. Baldwin developed a grading scale to quantitate severity of lesions in fish infected with *M. cerebralis*, and noted a difference in lesion distribution in brown vs rainbow trout. In addition, he worked on validating a PCR assay for detecting the presence of *M. cerebralis* DNA from material processed by the Pepsin-Trypsin Digest assay. The Utah Diagnostic Laboratory is fortunate to have Dr. Baldwin as their director.

(by Dr. Danielle Stanek, DVM WADDL)

CERTIFICATE OF REGISTRATION "EARLY BIRD" RENEWAL DISCOUNT ELIMINATED

On January 1, 2001 discounts given to those who paid their COR renewal fees early were eliminated. In the past if an aquaculture facility applicant sent in his COR renewal papers before the end of December, he was rewarded with a $25.00 credit towards the bill. Previously fee fishing applicants who sent in their COR renewal papers before December 31 were given a $5.00 credit. We learned at the first of the year that legislative law does not permit this activity. Although this discount was influential in early renewal for CORs, it was dropped when we learned it was inappropriate.

FED-EX SHIPPING DISCOUNTS NOT ALLOWED

Utah aquaculturists send samples via Fed Ex when their fish are tested for bacteriology, virology and parasitology. One cooler filled with bacteriological and whirling disease samples is sent to a lab in the State of Washington, and another cooler filled with virology samples is sent to a lab in Montana. It can be very costly to ship two coolers to two destinations by next day delivery. The coolers are also shipped back to Agriculture through express saver mail after the samples are delivered. An effort was made to help reduce the high sample shipment costs paid by the fish growers. Fish Health contacted Fed Ex to determine if the aquaculturists could qualify for cheaper government rates. Fed Ex indicated that this was possible and sent us the specifics to do so. One of the stipulations was to have each fish farmer sign a statement with their account number verifying that he would not use the special Fed Ex account for personal shipments. Those who had their fish inspected agreed that they would use this account only for shipping fish tissues collected by UDAF from inspections. Subsequently contact was made with the State of Utah person who negotiates contracts with Fed-Ex. He said the state could not allow non-state users to use the state account. Fed-Ex had previously stated that state agencies could be given a special rate for non-state employees. Fed-Ex was apparently uninformed of State policy.

Arizona Fish Industry
Continued from page 1

million in the next 10 years.

Arizona growers have also been able to keep their shrimp stocks free from diseases that are common in many areas of the world by rearing their stocks in fresh water with low concentrations of salt. Some of these diseases have devastated shrimp populations in Asia and Latin America in recent years. Shrimp can grow in both fresh water (with low concentrations of salt) and salt water. Some operations like Wood's and others get re-use of their water by irrigating their fields and crops with the nutrient-enriched water from their fish ponds.

From *Aquaculture News*, volume 9, number 7, June 2001.

BARLEY STRAW USED TO RID PONDS OF ALGAE

Some aquaculture providers are plagued with algae in their fish ponds. Several have asked how to get rid of it. In response, you may reduce algae in your pond by adding barley straw bales. Several growers in Utah have found success by using barley straw. The barley straw acts as an organic algaecide and is harmless to fish. A gunny sack full or bail of barley straw can be placed in the pond amongst the algae and anchored down (submerged) with a cinder block. The barley straw should be spaced every 10 square feet within the pond. It is a slow process and takes 3-8 weeks for barley straw to become an active organic algaecide. Don't expect immediate results. It is certainly worth a try. For best results, place the barley early in the spring time before plant growth occurs.

FISH FARMING PREDICTED TO OVERTAKE BEEF AS A LEADING FOOD SOURCE

Aquaculture is the fastest growing sector of the world food economy. Its output has increased at an average of 11% a year during the past decade. Climbing from 13 million tons produced in 1990 to 31 million tons in 1999, fish farming is poised to overtake cattle ranching as a food source by the end of this decade. According to the weekly newspaper of agriculture (*Feedstuffs)*, the shift reflects a basic change in worldwide diet. Over the last century, the world relied heavily on oceanic fisheries and rangelands to meet a growing demand for animal protein. However, that era is ending because both systems are reaching their production limits. Additional production of beef or seafood now depends on placing more cattle in feedlots or more fish in ponds. Fish are more efficient in conversion of feed to body mass when compared to many animals. Cattle require approximately 7kg of grain to add 1kg of live weight and fish require less than 2kg of grain for the same gain. This advantage has helped make fish farming the fastest growing protein production method, especially in the developing nations.

From *The Lean Trimmings Newsletter* published by the National Meat Association, January 2, 2001.

NEW FEE-FISHING AND AQUACULTURE FACILITIES LICENSED BY UDAF

Seven new fee-fishing operators have received CORs since our last newsletter. They include Kendrick Hafen (Santa Clara), Hal Bryant (Stockton), Stewart Norris (Ogden), Aspen Pond of Road Creek Ranch (Loa), Harward and Rees (Loa), Hill Air Force Base (Ogden) and Gary Stringham (Tabiona). Applications for three additional facilities are pending.

FISH PROCESSING PLANTS LICENSED UNDER NEW COR

Recently the Fish Health Policy Board reworked the Rule to include fish (and brine shrimp) processing plants, which were included under R58-17-17, Aquaculture Facility. Section 4-37-103 (2)(a) defines an aquaculture facility as any tank, canal, raceway, pond off-stream reservoir, or other structure used for aquaculture. A fish processing plant is an aquaculture facility used for receiving whole dead, eviscerated fresh or frozen aquatic animals for processing. Rule R58-17-17 (A) reads that a COR is required to operate an aquaculture facility as defined by section 4-37-103(2)(a). Currently there are four fish processing plants in Utah. They are owned and operated by McKay Morgan and Danny Anderson in Koosharem, Road Creek Ranch in Loa, Grant White in Paradise and Leland Barker in Smithfield. There is another fish processing plant in West Jordan that is in the process of being licensed. Brine shrimp processing companies in Utah also fall under the definition of a fish processing plant. They are required to have a COR if they import foreign cysts. This is to prevent cross contamination of native GSL cysts with those from

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